# Expedition 1 Crew

**William M. (Bill) Shepherd**

William (Bill) Shepherd, 47, Capt., USN, will serve as the International Space Station commander. Selected as an astronaut by NASA in 1984, Shepherd considers Babylon, N.Y., his hometown and will be making his fourth space flight. Shepherd served as deputy manager for the International Space Station Program from 1993 to 1996, before his assignment to command the first Expedition crew. His space shuttle flights include mission STS-27 in December 1988; STS-41 in October 1990; and STS-52 in October 1992. He has logged more than 440 hours in space.

**Yuri Pavlovich Gidzenko**

Yuri Pavlovich Gidzenko, 35, Lt. Col., Air Force Russia, will serve as the Soyuz commander. Gidzenko began his training as a Russian cosmonaut in 1989. He was born in the village of Elanets, Elanetsky district, Nikolayev region, Russia, and will be making his second space flight. Gidzenko commanded the Euromir-95 mission aboard the Mir Space Station from September 1995 to February 1996. He has logged more than 180 days in space.

**Sergei K. Krikalev**

Sergei Konstantinovich Krikalev, 38, will serve as the Flight Engineer. Selected as a Russian cosmonaut in 1985, Krikalev was born in Leningrad (renamed St. Petersburg), Russia, and he will be making his fourth space flight. He first flew as flight engineer on the second joint Soviet-French science mission aboard the Mir Space Station from November 1988 to April 1989. He next flew as flight engineer on the ninth Mir mission from May 1991 to March 1992. In February 1994, Krikalev became the first cosmonaut to fly on the space shuttle on mission STS-60, the first joint U.S.-Russian shuttle flight. In December 1998, he served on STS-88, the first International Space Station assembly mission. He has logged more than one year and three months in space, including seven space walks.

*In case of emergency…*

# Expedition crews well trained in medical procedures

Need to have that sore tooth extracted while flying aboard the International Space Station? Having respiratory problems and need to have an emergency tracheotomy performed? Is that heart in need of some quick cardiopulmonary resuscitation? Need to have that wound sutured? Not a problem.

Two of the three Expedition crewmembers for each mission are designated as Crew Medical Officers or CMOs and are trained to do basic dental procedures, perform CPR, do emergency tracheotomies, intubate a patient and more. They have been trained to use a number of medical devices for normal medical analysis as well as emergency medical procedures.

NASA JSC Photo 2000E23538 by James Blair

**Laura Lea Barnes, training support coordinator with Wyle Laboratories, exhibits the three bags of medical equipment and supplies that the Expedition 1 crew will have on board the International Space Station.**

Included in the Expedition 1 crew's cargo are three bags of medical equipment and supplies: the Ambulatory Medical Pack, the Advanced Life Support Pack and the Crew Contamination Protection Kit.

The Ambulatory Medical Pack contains oral medications, topical ointments and creams as well as saline solution and eye drops, bandages and gauze, sterile gloves, thermometers, eye shields, splints, and cough lozenges. There are also surgical supplies including a disposable skin stapler, a staple remover, sterile gloves and sterile surgical instruments – everything the crew may need to perform simple surgery.

"We train the CMOs how to do simple suturing," said Laura Lea Barnes, training support coordinator with Wyle Laboratories. "We train them to suture on pig's feet like you would get at the grocery store. Crewmembers have several options to close a wound. They can use sutures (needle and thread), staples, a surgical skin adhesive like super glue or strips of surgical tape."

The AMP also contains a Portable Clinical Blood Analyzer subpack. Every 60 days, crewmembers do a blood analysis. The dental subpack is also in the AMP. "We teach our crewmembers how to take care of their teeth," said Barnes. "They can do temporary fillings, recement a crown and extract teeth." Thankfully, they also know how to anesthetize the site before removing the tooth. Each received a one-hour course in general dentistry at the JSC Clinic.

Crewmembers perform a physical exam every 30 days, and everything they need to complete it can be found in the Physical Exam Subpack – an otoscope, an ophthalmoscope, and a reflex hammer.

The Advanced Life Support Pack contains packets with everything needed to establish an airway (including a laryngoscope and suction device) as well as emergency medications. The Crew Contamination Protection Kit provides a way for the crew to clean up chemical spills and protect themselves.

The crewmembers will be provided with a medical checklist that includes all of the instructions for procedures they may need to perform – from loading syringes to extracting teeth. It is written in English and Russian. ■

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cooling and power supply. So in many cases, we will do this job in parallel: crew will work outside and we will work inside making all internal connections."

The Expedition 1 crew began training on October 14, 1996, in Russia. Shepherd, Gidzenko and Krikalev have traveled back and forth between the U.S. and Russia over the past four years, spending 44 weeks as an entire crew training in the U.S. and nearly double that time in Russia.

Most of the crew's training in the U.S. took place at JSC; some training took place at Marshall Space Fight Center and at Kennedy Space Center. Most of the training in Russia took place at the Gagarin Cosmonaut Training Center in Star City, with some training at Energia in Korolev, some Russian payload training in Germany and survival training at the Black Sea and Ruza.

The Soyuz spacecraft the first crew rides to orbit will remain docked with the station. It will be changed out with a fresh spacecraft every six months. Thus, part of the crew's training regimen has included time at Russia's Black Sea, learning how to deal with the possibility of a water landing in a Russian Soyuz spacecraft.

Training of the first Expedition crew has called for both U.S. and Russian training instructors to learn about different approaches to teaching space flight crews.

"The ISS Program has been a great benefit to all training instructors from both countries as each has learned different approaches to teaching," said Debbie Trainor, NASA increment training integrator for Expedition 1.

The Expedition 1 crewmembers will return aboard the space shuttle on assembly flight 5A.1. They will be relieved by a new crew of three that will be launched on the shuttle on flight 5A.1. ■

# Expedition 1 Science

In addition to assisting shuttle visitors and checking out station hardware and software, the Expedition 1 crew will conduct five U.S. experiments and five Station Detailed Test Objectives covering microgravity research, education, Earth observation, Department of Defense and human life science. Experiments and research goals are:

- **Protein Crystal Growth** – *Enhanced Gaseous Nitrogen*: Identification of molecular structures that may lead to the development of new drugs, shorten development time and improve our understanding of disease states.
- **Education** – *Seed Growth Kit*: Educational experiment to demonstrate to schoolchildren the germination and growth of seeds in space.
- **Earth Knowledge Acquired by Middle Schools**: Educational experiment to take high-resolution electronic images of the Earth, downlink them to schools and discuss the images with children. Students will develop research projects and specify Earth photography targets for use in their projects.
- **Crew Earth Observations**: To photograph Earth features of geological, meteorological or other interest.
- **Middeck Active Control Experiment II**: Launched on 2A.2B and stowed in the Node, MACE II will validate modeling and control designs for adaptive neural net control and multi-body dynamics and control in microgravity.
- **Spatial Differences in Carbon Dioxide Concentration**: Determine carbon dioxide concentrations in various locations of the ISS and under different environmental conditions.
- **Interim Resistive Exercise Device Operational Use and Impact to ISS Environment**: View IRED operation during regularly scheduled sessions, verify exercise in the Node is not raising carbon dioxide and temperature levels and collect real-time crew input regarding IRED operations during a scheduled exercise period.
- **Treadmill Vibration Isolation System Feasibility of Using Different Subject Load Device Settings**: Evaluate heart rates and comfort levels during nominal aerobic treadmill ISS exercise countermeasure operations.
- **TVIS Stability While Running/Walking During Scheduled Aerobic Exercise**: Assess whether the treadmill is providing the expected stability with respect to the impact of loads during exercise.
- **TVIS Subject Load Device Effect on Locomotion and Heart Rate**: Determine how crewmembers respond to various speeds and loads, document the motions of the knee and rear foot complex, and document the crewmember's heart rate responses.

"The U.S. experiments for the first crew were selected based on their science priority and ability to fit within the resource constraints of ISS assembly," said Ven Feng, NASA increment payload manager. "They represent an important first step in realizing the research potential of the International Space Station and demonstrating that we can utilize the station while we're building it." ■